Generating station site North Channel

Submission to the Royal Commission on Electric Power Planning

Requirement for a Generating Station Site on the North Channel of Lake Huron

Submission of

ONTARIO HYDRO

to the

Royal Commission

on Electric Power Planning

December 1977

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Synopsis

Additional sites are being sought to accommodate new generating stations required to meet East System load growth. A generating station site is also being sought which could accommodate the future installation of heavy water production facilities. Technical and regulatory requirements limit the choices available for sites capable of accommodating both generation and heavy water production facilities. It is believed these requirements can be met in the North Channel area.

A site on the North Channel would allow for the location of generation facilities close to major loads thus improving reliability of service and reducing transmission losses. The future construction of facilities on the site would provide employment and other economic benefits to the North Channel area.

The North Channel area is the only area in which the site selection process is sufficiently advanced to allow a new site to be considered for generation coming into service in the late 1980's. Therefore, the planning process for the provision of a new generating station site on the North Channel should be continued in an orderly way so that the site can be considered for generating stations coming into service in the late 1980's.

For all of the above reasons, confirmation of the need for the site being sought on the North Channel is therefore requested from the Royal Commission on Electric Power Planning.

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1.0 INTRODUCTION

On July 11, 1974, the Ontario Government announced that it would hold public hearings into the long-range planning of Ontario's electrical power system. In the July 11 statement, the Government also announced that Ontario Hydro had been given approval to proceed with several projects, one of which was the studies and public participation for the selection of a new generating station site in the North Channel of Lake Huron along with the necessary transmission system.

On March 13, 1975, the Honourable Allan Grossman, Provincial Secretary for Resources Development, announced in the Legislature the Government's decision that the hearings into Ontario Hydro's long-range planning would be carried out by an independent commission of enquiry. He stated, "The Commission will focus on the broad conceptual consequences of alternative ways of supplying electrical power during the period 1983-1993".

The March 13, 1975 statement also noted that there are certain electrical power generating and transmission projects that Ontario Hydro considers must be initiated during the tenure of the Commission and that the Commission would look into the need for these projects. At a meeting of the Royal Commission on Electric Power Planning in Listowel, Ontario on January 20, 1977, Dr. Porter stated that he interpreted the Commission's Terms of Reference in respect of these projects as being limited to a consideration of the need or requirement only in terms of supply, demand and timing. Copies of correspondence between Dr. Porter and Mr. B.B. Campbell counsel representing Ontario Hydro, confirming Ontario Hydro's understanding of the Commission's position are attached as Appendices A and B to this submission. Appendix C is a copy of the transcript of the pertinent portion of the Listowel meeting.

One important aspect to consider when dealing with the need for major new generation facilities on a new site is that from the time the need is identified until the first generating unit is placed in commercial service requires a time period of about thirteen years. In order to reduce the lead time and to provide flexibility in developing the power system Ontario Hydro proposes to acquire a number of new sites suitable for the installation of thermal generating stations. In this way, the time from decision to proceed with a generating station until its in-service date can be reduced to ten years or less. Further, decisions regarding the specific facilities proposed for a site can then take advantage of the most recent information such as cost and availability of fuels, the latest load forecasts, socioeconomic conditions, environmental information and possibly new

technologies. This submission therefore deals only with the requirements for a site on the North Channel. The location of the specific site and the requirements and specifications for a specific facility will be subject to the review process established under the Environmental Assessment Act.

A site on the North Channel is desirable for the following reasons:

(a) Major generation facilities are required to supply the growing East System loads and the North Channel is one of the areas in which system planning considerations indicate a site should be available.

(b) Northeastern Ontario is now deficient in local generating capacity for energy supply and will soon become deficient in peak capacity. These deficits will increase as the northeastern Ontario loads grow. A major generating facility located in northeastern Ontario would be close to major loads and would substantially reduce transmission losses.

(c) Ontario's CANDU nuclear generating program may require additional supply facilities for heavy water. Technical and regulatory requirements limit the choices available for such a site, but they can be met in the North Channel area.

(d) The future location of a major generating facility on the North Channel would provide employment and other economic benefits to an area where both the Provincial Government and Municipal and Community leaders have indicated industrial development is needed. Also, it appears to be in accordance with the Ontario Government's policy of encouraging growth in northern Ontario.

2.0 East System Considerations

2.1 The East System Load Forecast

The Ontario Hydro East System is defined as the area east of a line through Wawa and it accounts for about 95% of the electric power and energy supplied by Ontario Hydro.

The planning process for new supply facilities begins with the load forecast. At least once a year, a complete review is made of the load forecast for the following ten years. In the interval between the successive annual reviews, the progress of actual load growth and economic conditions is monitored and, if necessary, revised forecasts are issued to reflect conditions

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different from those contemplated when the last complete annual review was made. The annual forecasts are made in considerable geographic detail and are based on forecasts, made in the field, of individual wholesale supply users. In this way a wealth of detailed knowledge and experience is brought to bear on the forecast.

Projection of these forecasts to twenty year time horizons is a hazardous exercise because so many new variables can come to bear. For example, population can be regarded as virtually fixed in the short run, but in the longer run, it may be a dominant influence and extremely hazardous to forecast.

The risks introduced by errors in the load forecast are two-fold: inadequate capacity due to underestimating the load, or excess capacity due to overestimating the load. Inadequate capacity can result in an unreliable supply; and this may cause direct financial losses to power customers and increased social costs to the province. Excess capacity can lead to financial risks resulting from inadequate revenues to Ontario Hydro in the short term, and direct financial losses to power customers due to unnecessary high power costs in the long term. The load forecast effort is therefore preoccupied with reducing error to a minimum. In practice, this means that the forecast effort should try to avoid consistent error in either direction. Ontario Hydro's forecasts are designed not to be biased in either direction and historically, they have been very accurate.

Ontario Hydro's 1977 load forecast implies a gradually declining pattern of electric load growth from current rates of about 7% per annum to 6% by the mid-1990's. This declining growth pattern also reflects a policy of conservation and load management adopted by the Ontario Hydro Board in 1976. The 1977 forecast of the East System most likely primary peak load to 1986 and a projection of the load to 1997 is shown in Figure 1. It is noted that the load is expected to grow from an actual 1976 peak load of 15,079 MW to about 35,800 MW in 1990.

2.2 Requirement for Additional East System Generation Facilities

The generation program up to and including Darlington GS has been approved by the Provincial Government. The generation program which is currently being used for planning purposes is shown in Figure 2, up to the year 1997. The program for generation not yet approved should not be considered firm but only a guide indicative of probable future requirements for additional capacity. The actual selection and approval of individual generating station projects for design and construction commits each project only as required to meet in-service dates.

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Ontario Hydro currently has studies underway to determine feasible locations for the next two generating stations after Darlington GS which are designated as E15 and E16. In order to meet the required in-service dates, it is necessary to limit the locations of these two stations to sites which are currently owned by Ontario Hydro. Therefore, a site on the North Channel could only be used for E17 or subsequent stations.

The requirement for additional generation facilities arises solely from growth in demand for electric power. A secondary consideration regarding the amount of new generation required in any given time period is the degree of reliability with which the demand is to be met. It is this reliability target which determines the amount of reserve generation required.

The reliability of a generating system is dependent upon many factors, only some of which can be estimated with a reasonable degree of confidence. Probability techniques are applied to those factors which can be estimated in order to indicate the relative levels of reliability likely in the future. This analysis, combined with judgement based on experience, leads Ontario Hydro to believe that installed generating capacity on its system should be about 25 to 30% greater than the expected peak load in order to produce a desirable level of reliability.

Recently imposed financial restraints on Ontario Hydro's Capital Construction Program have resulted in deferral of the in-service dates of many of Ontario Hydro's major projects. As a result, after 1979 the committed generation program will provide reliability levels considerably below historical standards. In fact estimated reserve levels decline from about 26% in 1980 to about 18% in 1987 and 1988. To maintain reserves at desirable levels new generating facilities will be required.

Figure 3 illustrates the speed with which the generation reserves decline if it is assumed that generation additions are stopped and the load continues to grow. As long as the electric load continues to grow, additional generating facilities will be required. Different rates of load growth or different reserve levels would effect the timing of generation additions but not the need for such additions.

2.3 Requirement for Additional Heavy Water Facilities

It it expected that a significant amount of nuclear generating capacity will be installed over the next two decades as illustrated by Figure 2. The program illustrated requires large quantities of heavy water to initially fill the reactor systems, and small make-up quantities to compensate for losses during operation. The extent of this heavy water demand is shown on Figure 4.

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Ontario Hydro's presently committed sources of supply for heavy water are the Bruce Heavy Water Plants (BHWP) A, B, and D. The supply from these sources has been estimated on a 'probable' and 'dependable' basis. The probability of the actual supply exceeding the 'dependable' estimates is 90% and of it exceeding the 'probable' estimates is 50%. The supply curves are superimposed on the demand curve on Figure 4.

The demand curve makes no allowance for possible acceleration in the rate of nuclear installation. Also the supply curve makes no allowance for possible delays in the in-service date of BHWP B and D, nor allowance for unforeseen operational problems. A shortfall in heavy water supply could delay the in-service date of one or more nuclear units and result in major economic penalties.

For these reasons, it is desirable that the dependable supply equals or exceeds the forecast demand. On this basis the fourth heavy water plant; ie., the plant after BHWP A, B and D, should be tentatively scheduled to have an in-service date in the early 1990's. If, however, the excellent performance of BHWP "A" continues, and is achieved at Plants B and D, the in-service date of a fourth plant may be postponed several years.

The Bruce Nuclear complex is the only site owned by Ontario Hydro which is suitable for heavy water production facilities and it is a possible location for the fourth heavy water plant. However, for a variety of reasons, it may be decided not to locate additional heavy water facilities at the Bruce site and it is therefore desirable to acquire another site which is suitable for heavy water production facilities. Economic and land use considerations make it preferable to locate such facilities at the same site as a thermal generating station.

3.0 Northeastern Ontario Considerations

3.1 The Northeastern Region Load Forecast

The geographical extent of Ontario Hydro's Northeastern Region is shown in Figure 5. The Figure also shows that the majority of the loads in the Region are concentrated in a relatively narrow band from North Bay to Sault Ste. Marie. Roughly 63% of the total Northeastern Region load is concentrated within the shaded areas of this band.

The economy of northern Ontario is dominated by the forest products and mining industries. Both of these industries are quite sensitive to fluctuations in the business cycle, and since

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they both have a high export content, demand for their products is sensitive not only to fluctuations in the Canadian economy, but to that of the United States and to some extent to the general international economic climate. Apart from these two industries, the other major activity is the tourist industry which is not power intensive. It should be noted that there are considerable uncertainties in any forecast of electrical demand due to the sensitivity of the demand to economic conditions in Canada and elsewhere. In part the projected slowing rate of growth in the demand for electricity reflects anticipated slower growth in the North American economy. Conversely, if the economy were to suddenly pick up, additional demands would likely be placed on the electric supply.

The Sudbury Basin contains the world's largest known deposit of nickel, but other deposits in Canada (such as at Thompson, Manitoba) and overseas have resulted in a dramatic decline in Ontario's share of world nickel production. At present, the market for nickel is quite soft and appears likely to remain so until the next economic boom appears. Northern Ontario is also a significant producer of nonferrous and base metals. The demand for iron and copper is weak at the moment, and like that for nickel is likely to remain so, but it too is subject to considerable upward pressure in the event of an economic boom. The area also has a significant gold mining industry, but the response to the increase of price of gold has not been as dramatic as one might have imagined. This is partly due to the continuing uncertainty of the future price of gold, and partly to the rapid escalation in the cost of mining it.

The forest products industry has been a significant source of growth in power demands in the past, but its future potential for growth is limited by the amount of unappropriated timber land which remains available. The industry faces further constraints on its growth due to growing pressures to preserve and enhance the environment, but at the same time these pressures may lead to increase of electrical demand for purposes of pollution control. The industry is currently undergoing modest expansion which consists for the most part of extensions to existing plants.

Ontario Hydro customers are divided into three classifications:

A. Municipal

The power supplied to municipalities for resale.

B. Retail

The power supplied by Ontario Hydro to customers outside the municipalities.

C. Direct Industrials

The power supplied directly by Ontario Hydro to industrial customers.

The actual loads from 1940 and forecast loads to 1997 in the Northeastern Region for each of the above classifications are shown in Figure 6. It is evident that most of the load in the Northeast is industrial. For illustrative purposes the total Northeastern Region primary peak load is shown in Figure 1.

The electric load varies throughout each day and from day to day throughout the year. The load is highest in the daytime and lowest at night and on weekends. Due to the higher concentration of heavy industry and mining loads in the Northeast, the average daily load factor is quite high.

Figure 7 includes an annual load duration curve for the Northeastern Region showing the variation of load with percentage of time. The Figure also shows the average monthly load as a percentage of the annual peak.

Not all the load in northeastern Ontario is supplied by Ontario Hydro. A significant portion of the area which encompasses the City of Sault Ste Marie and the Algoma Steel Company is served by the Great Lakes Power Company (GLP Co). This Company purchases a substantial block of power from Ontario Hydro which currently is approximately 10% of Ontario Hydro's total Northeastern Region load. However, it is expected that Ontario Hydro will provide for the greater part of the growth in electric demand in this area.

In addition to the GLP Co, several industries in northern Ontario generate some of their own electricity by hydraulic and thermal means. The prospects for significant extensions of industrial generation by hydraulic means are not expected to have a large affect on future load supplied by Ontario Hydro. INCO is currently studying the feasibility of hydraulic generation on the Spanish River which may have an installed capacity of about 90 MW and an annual capacity factor of approximately 50%. It is possible that further fossil-fuelled generation may be installed by industries depending upon the associated demand for process steam and the price of electricity supplied by Ontario Hydro.

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3.2 Existing Hydraulic Generation Facilities

With the exception of some small diesel generating units, all of the power generated by Ontario Hydro in northeastern Ontario comes from hydraulic generating stations, many of which are designed as peaking plants and operate at capacity factors well below system load factor. This generation is generally operated at peak output for about 2 hours per day on normal working days and at reduced output during the remaining hours of the working day and on weekends. The level of reduced output is dependent upon the water flows available at the time of actual operation. There can be significant economies associated with this type of operation because it reduces the amount of more costly thermal generation (such as combustion turbines, or older, less efficient thermal units) which would otherwise have to be run to satisfy the daily peak load demand of the system.

Figure 8 lists the December peak and average energy output for the Northeastern hydraulic stations for dependable and median water flow conditions. The dependable values are those attained or exceeded in most years. The median values are those which on average have a probability of being attained or exceeded one year out of two. The dependable values are used for planning purposes.

3.3 Hydraulic Generation Potential

Reviews are made from time to time of all potential hydraulic capacity and sites will be proposed for development if their cost is attractive and they serve a useful purpose on the system. For instance, a study is currently in process to assess the feasibility of the Patten Post site on the Mississagi River. Although this site could have a peaking capacity of about 250 MW, its energy potential is estimated to be less than 50 average megawatts. Details of the remaining hydraulic sites and their potentials are provided in Appendix I of Ontario Hydro's Generation Non-Nuclear Submission (Exhibit #107).

The only major undeveloped sources of conventional hydroelectric energy lie on the Albany River system. The Albany, together with major diversions of the Winisk and Attawapiskat Rivers and rediversion of the Ogoki River into the Albany, could have a peak power potential of about 3000 MW. The energy potential of this development would be about 2,000 average megawatts. Without major diversions, the energy potential of the Albany is estimated at about 1,000 average megawatts.

Preliminary engineering and economic studies completed in 1973 indicated that the development of the Albany would be too costly compared to nuclear or fossil-steam generation. Major additional

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studies would be required before a firm conclusion could be reached as to the feasibility, acceptability and economics of developing part or all of the northern hydro electric potential.

3.4 Generation/Load Balance

3.4.1 Peak Load and Peak Generation

At time of system peak load when the hydraulic generation in the Northeastern Region is operated at full output, there is currently an excess of generation over load which is transmitted to other parts of the East System or to the Thunder Bay area. Based on the 1977 load forecast the peak load is expected to exceed the peak output of the hydraulic generation in the Northeast by 1980. Figure 9 shows that the deficiency in peak hydraulic capacity compared to the forecast peak load in Northeastern Region continues to increase until additional generation is installed in the Region. The Figure assumes for illustrative purposes that a thermal station has a peak output of 3000 MW and that the first unit comes in service in 1989.

3.4.2 Energy Supply and Demand

The hydraulic generation in Northeastern Region is inadequate to supply the energy requirements of the area except in the spring and possibly the early summer. During the rest of the year the area's energy deficits are supplied from generation in the south over existing transmission lines. The dependable monthly energy for the Northeastern hydraulic generation is shown in the inset in Figure 10. It is evident that the largest deficits will occur in the winter months.

Figure 10 is a graphical illustration of the difference (in average megawatts) between dependable energy supply and demand for the month of December from the present to the mid-1990's both with and without a new thermal generating station in the Region. The average output of the thermal station is assumed to be 80% of an installed capacity of 3000 MW. The Figure shows ever-increasing dependence of the Northeastern Region loads on supply facilities in other parts of Ontario unless additional generation is installed.

3.5 Transmission Losses

If no additional generation is installed in Northeastern Region, the increasing power deficits will likely continue to be supplied from generation in the south. Since the distances are long, the line losses are significant. For example, by 1997 the savings in transmission losses by installing generation at a North Channel site could amount to several hundred megawatts.

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3.6 Reliability

The reliability of supply to customer's loads is dependent upon the capability of the bulk power system to delivery power continuously as well as upon the adequacy of the generating system to supply the total load. The reliability of supply can be materially improved by siting generation facilites as close as practicable to major load centres. This results because the exposure of transmission lines to natural and man-made hazards increases with the length of the lines.

Installing generation in the North Channel area will improve reliability of supply to loads in Northeastern Region.

3.7 Social-Economic Factors

A report of the Ontario Government ("Northeastern Ontario Regional Strategy, Proposed Strategy, March 1976) shows that the number of new opportunities for employment has grown more slowly in Northeastern Ontario than in the rest of Ontario.

Between 1961 and 1971, total regional employment increased by just over 20%, little more than half the rate of 38% for the rest of the province. This slow growth in the number of jobs has led to relatively high unemployment rates in the region as a whole and to a steady stream of people leaving the region in search of jobs elsewhere. Although this report deals with the region as a whole, the information is applicable to the North Channel area.

The mainstays of employment in the region, mining and forestry, do not always provide secure jobs. Periodic downturns in the demand for mineral and wood products often lead to production cutbacks and worker layoffs of varying durations. In mining, depletion of ore reserves leads to eventual closures of operation and permanent layoffs. In many of the single-enterprise communities of the region, temporary and permanent layoffs present particular difficulties, because few alternative employment opportunities are readily available. The reduced purchasing power of those out of work hurts businesses in the community.

The proposed government strategy sets out several goals for the region that would provide a preferable economic and social future based on the aspirations of residents of the Northeastern Ontario Planning Region.

The Strategy Report also states that the primary economic goal is to "promote economic development in Northeastern Ontario in a way that ensures that the benefits will acrue primarily to the people

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of the region, that makes optimum use of the potentials of the region, and that respects the environmental attributes and cultural attitudes of the region". In order to meet this goal four objectives are proposed:

(a) greater stability of production, employment, and earnings,

(b) increased diversity of occupational opportunities,

(c) improvement of productivity and earnings,

(d) growth of employment opportunities and population.

In order to meet economic objectives, population should grow at an annual rate of 1.7%, rather than the present 0.6% trend. This would require a net in-migration of 0.6%. Present trends show a net out-migration of 0.5% annually.

The Report also states that, coupled with population growth is a desire to significantly expand and diversify the region's economy. This will necessitate solving regional disparities and unemployment problems.

It is Ontario Hydro's view that development of major electric facilities in the North Channel area will have a positive effect on the above goals. Indeed both Ontario Hydro and the Ontario government have received representations from Municipal and Community leaders in the North Channel area urging the establishment of generation facilities in the area. Of course, opposition has also been shown to such a project.

During the construction of a large generating station, which may take from 6 to 8 years, the workforce at a site builds up gradually to a peak of several thousand workers and then declines at about the same rate to an eventual operating staff of some 400 to 600 permanent employees. Estimates of construction workforce requirements for a North Channel station indicate that the workforce would peak at about 2,500 workers for a coal-fired station or 3,500 workers for nuclear.

4.0 Siting Options

4.1 In Southern Ontario

As noted in Section 2.2, Ontario Hydro currently has studies under way to determine locations for the next two generating stations after Darlington GS. As explained, the only feasible locations for these two stations designated E15 and E16 are four existing sites east of Toronto; namely, Darlington, Wesleyville, Lennox and Chats Falls.

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The location of E15 and E16 at two of the above sites, although necessary if the East System loads are to be supplied, will result in a large excess of generation over load in the area east of Toronto. The location of E17 east of Toronto would increase this imbalance and continue it farther into the future. It is therefore considered prudent to locate this station in another part of Ontario.

Public participation is currently under way in eastern Ontario and southwestern Ontario to select new generating station sites and the associated transmission routes. These activities are in a relatively early phase and it is not expected that new sites in these southern areas can be acquired in time for E17. However, the site selection study on the North Channel is nearing completion and with timely decisions and approvals, the site could be available for a first generating unit in service date in the late 1980's.

Another advantage of locating stations following E16 on new sites is a greater degree of flexibility in developing and operating the future system. This would be the case even if all existing sites could be developed to their full capacity prior to acquisition of any new sites. Further, this would provide a longer time span between stations on existing sites for monitoring and mitigating possible unforeseen environmental effects resulting from the first station.

4.2 In Northeastern Ontario

Several inland lakes and rivers in Northeastern Ontario have been suggested as potential sites for development of thermal generating stations. These include Lakes Nipissing, Timiskaming and Wanapitei and the Ottawa River. Their relatively small size makes them unsuitable for multiple plant sites. Each might accommodate 2000 to 3000 MW of generating capacity but none is considered suitable for heavy water production facilities. Also, Wanapitei may be unsuitable for a fossil-fuelled station because of its proximity to Sudbury.

It has also been suggested that development of major thermal generating stations on more remote bodies of water such as Lake Superior, James Bay or the larger, more northerly rivers may be appropriate. However, their great distance from major load centres would make the development and incorporation of such sites very costly.

The potential for developing the Onakawana lignite deposits for electricity generation has received considerable attention in the past. Ontario Hydro is currently providing information to the leaseholder of the property who is carrying out an assessment of

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the economic feasibility of the project. The terms for this review are that private concerns would build and own the station with a capacity between 900 MW and 1200 MW. Ontario Hydro would operate the station and purchase the power. Such a development, if built, would not affect the desirability of obtaining a site on the North Channel although it may affect the timing of station construction.

4.3 Options for Heavy Water Siting

The siting requirements for heavy water facilities are quite similar to those of nuclear stations with some additional requirements peculiar to the heavy water production process. This process (Girdler-Sulphide) uses substantial quantities of hydrogen sulphide gas and requires large and very secure supplies of process steam and electric energy. These requirements make it most economic for both thermal generation and heavy water facilities to be located at the same site.

The most stringent siting regulation for heavy water facilities is related to the concern for public safety in the event of an accidental release of a large quantity of hydrogen sulphide. This requirement calls for the establishment of a controlled zone, with low population density, within an eight kilometre radius of the plant. By comparison a nuclear generating station requires an exclusion radius of about 900 m.

There are relatively few locations in Ontario which meet all of the siting requirements associated with nuclear generation and heavy water production facilities. One of these areas is the North Channel of Lake Huron.

5.0 Conclusions

A. If the East System load continues to grow as forecast, one new generating station must be placed in service each year after 1987, each with a capacity of about 3000 MW. As a first step in developing these facilities, additional generating station sites must be acquired in various parts of Ontario.

B. A site suitable for heavy water production facilities is required. For economic and land use reasons, this site should be combined with a thermal generating station site.

C. A North Channel site capable of accommodating thermal generation and heavy water production facilities should be acquired because:

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- The area is relatively close to the loads the generation would supply and this would improve reliability and reduce transmission losses.

- The North Channel is one of relatively few areas in Ontario suitable for heavy water facilities.

- The construction and operation of these facilities would provide employment and other economic benefits to an area where government and community leaders have indicated industrial development is desirable.

D. A North Channel site should be acquired as soon as possible because it is the only new site which could be available for a generating facility coming into service in the late 1980's.

COPY FROM
TILLEY, CARSON & FINDLAY

APPENDIX A

February 3, 1977

Dr. Arthur Porter,
Chairman,
Royal Commission on Electric
Power Planning,
14 Carlton Street,
Toronto, Ontario.

Dear Dr. Porter:

Re: Priority Projects

This letter will confirm our recent discussion with respect to the timing and content of Ontario Hydro's submissions dealing with the priority projects.

As discussed, and as subsequently stated by you at Listowel on January 20, 1977, these hearings will examine load growth (Demand), the capability of existing facilities to supply the load (Supply), and the in service dates appropriate for additional facilities (Timing). Within these general headings and for the geographic areas of eastern Ontario, southwestern Ontario, and the North Channel, my client is preparing its submissions to support its view as to the need for additional facilities. I am informed that these submissions will be available by October of 1977.

It was further agreed that your hearings, and therefore my client's submissions, will not extend to a consideration of the nature of the additional facilities which might be required, nor to their location.

I further understand that the hearings in connection with the priority projects will be scheduled for January or at the latest, February, 1978.

Trusting that the above accurately reflects our discussions, I remain,

Yours very truly,

BBC:st

Ontario

APPENDIX B

ice of the
cutive Director

Royal Commission
on Electric Power
Planning

416/965-2111

7th Floor
14 Carlton Street
Toronto Ontario
M5B 1K5

February 10, 1977

Mr. B. B. Campbell
Tilley, Carson & Findlay
44 King Street West
Toronto, Ontario
M5H 1G4

Dear Mr. Campbell:

Re: Priority Projects

This short letter is to confirm that your letter of February 3, 1977 accurately reflects the contents of your recent discussions with Dr. Porter regarding the priority projects.

At the present time we are expecting the Ontario Hydro submissions to be forwarded to us in October. Upon receipt of the submissions we will establish a firm date for the commencement of the hearings.

Yours very truly,

Ronald C. Smith
Executive Director

RCS/re

ROYAL COMMISSION

ON

ELECTRIC POWER PLANNING

Hearing held in the Kinsmen's Hall, Listowel, Ontario, on the 20th day of January, 1977, at 8:00 p.m.

THE COMMISSION:

DR. ARTHUR PORTER	-	Chairman
ROBERT E.E. COSTELLO, ESQ.	-	Commissioner
DR. WILLIAM M. STEVENSON	-	Commissioner
GEORGE McCAGUE, ESQ.	-	Commissioner

COMMISSION STAFF:

MR. R. SMITH	Executive Director
MR. F.R. HUME, Q.C.	Counsel for the Commission
DR. R. ROSEHART	Scientific Counsellor

ONTARIO HYDRO REPRESENTATIVES: MR. BRUCE CAMPBELL, Counsel

PUBLIC INTEREST COALITION ON ENERGY PLANNING: MS. ROSE McMILLAN, Co-ordinator

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INDEX OF PARTICIPANTS

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---Upon commencing at 8:00 p.m.

DR. PORTER: Ladies and gentlemen, may we come to order, please.

First of all, on behalf of my fellow Commissioners who you know very well of course, George McCague, Bob Costello and Bill Stevenson; Fred Hume, counsel for the Commission, Ron Smith, Executive Director; and Bob Rosehart, Scientific Counsellor; and of course myself, we welcome you to this public information hearing.

It is coincidental that we were in Listowel almost 12 months ago, in fact on the night of January the 22nd when the temperature, I seem to remember, was -34 degrees Celsius and that meeting was the last of the preliminary meetings of the Commission.

This evening is the last of the public information hearings, so it is coincidental that this should have happened. In fact, this hearing is really a continuation of the 78th session of a hearing which was adjourned on November 25th.

The Food Land Steering Committee's submission was presented on that day and it was based largely on the major research report which had been undertaken for the Food Land Committee by Professor

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Norman Pearson who unfortunately on that day was ill and we agreed that the hearing would be adjourned until tonight and we are delighted, Norman, to see you back in form again.

At this time I would like to recognize the appearance of Bruce Campbell, Counsel for Ontario Hydro; and Rose McMillan, who is the co-ordinator with the Public Interest Coalition.

Before proceeding with the major business of the hearing I thought it might be a good idea at this time to clear up a possible misunderstanding which has arisen recently in connection really with the implementation of paragraph 4 of our terms of reference. This relates to the so-called priority projects and perhaps just to remind you what this term of reference consists of, I will quote it. It is to consider and report on a priority basis on the need for a north channel generating station, a second 500 Kv line from Bruce, a 500 Kv line from Kitchener, a 500 Kv line from Nanticoke to London and a 500 Kv line in the Ottawa/Cornwall area and other projects as may be directed by the Lieutenant Governor in Council.

It has been drawn to my attention at a recent meeting of Ontario Hydro Citizens Committee

held here in Listowel it was stated that the Commission would finish its inquiry including these priority projects by the end of this year. This isn't quite accurate.

Let me briefly summarize the position, especially insofar as these priority projects are concerned.

First of all, the Commission needs information of a specific kind relating to these projects and Ontario Hydro expects to provide the Commission with this information as it relates to the following three areas: first, the projected load growth in the regions under consideration; second, the capability of existing facilities to supply the load concentrating on the period 1983 to 1993, this being the time period for which the Commission recommendations will apply and, thirdly, the in-service date which Ontario Hydro considers to be appropriate for any additional facilities.

Now, this information will be available to the Commission we are told in October of this year, that is October 1977. However, as many of you know, because of the length of time which is going to be involved in the third phase of the Commission's hearings, that is the phase we call the debate phase, and that period

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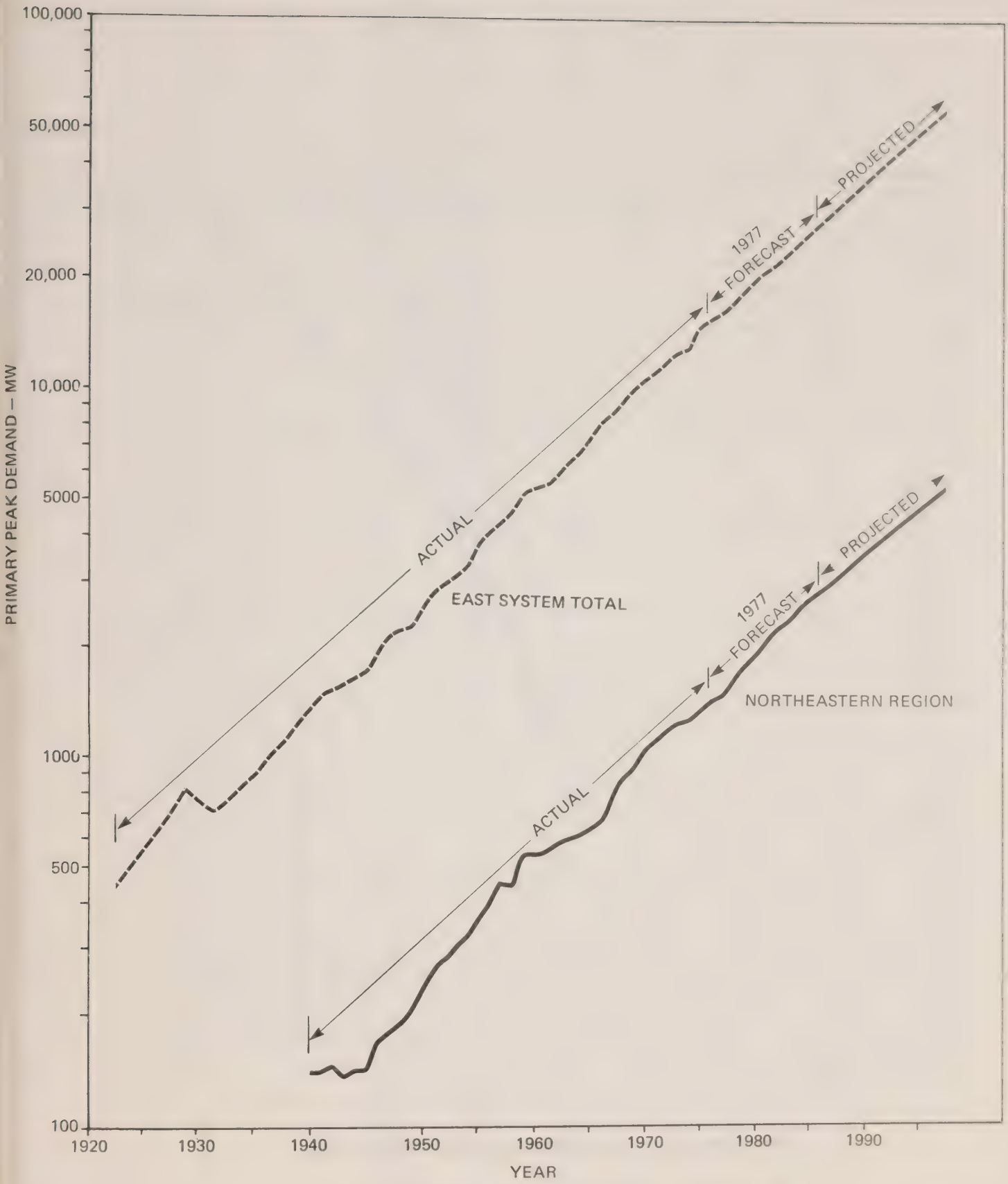
of time will probably last for about the middle of April to the end of October, because of that there will be no opportunity for special hearings to be held in connection with the priority projects during this year and the present planning is that they will take place as soon after the end of the debate phase hearings and the time taken for the final report based on that debate phase hearings to be written; so it looks as though right now the hearings on those priority projects will take place next January and February with a report I think hopefully by March or at the very latest, April. I thought it would be a good idea to clear up that misunderstanding.

Let me also mention at this time that the series of issue papers, eight in all, are presently being prepared and all of these will be available by the middle of March. It is a very big task and we are doing our best to meet this deadline. At the present time two of these papers have been published, one on nuclear power in Ontario and the second one, the demand for electric power. A third one will be published within the next two weeks. I pretty well finished it this morning but there is some more information needed for one of the appendices, and that is the one on conventional and alternative



EAST SYSTEM & NORTHEASTERN REGION
HISTORICAL & FORECAST PRIMARY PEAK DEMAND – 1922 TO 1997

FIGURE 1

Generating Station	Type	No. x Size of Units in MW	Units In-Service in Year Shown																			
			77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
Nanticoke 7-8	F	2 x 531		2																			
Lennox	F	1 x 547	1																				
Bruce A	N	4 x 746	2	1	1																		
Wesleyville	F	4 x 547					1	1	2														
Pickering B	N	4 x 516					1	2	1														
Bruce B	N	4 x 769							1	1	1	1											
Darlington	N	4 x 850									1	1	1	1									
E-15	N	4 x 516											1	1	2								
E-16	N	4 x 850												1	1	2							
E-17	F	4 x 750													2	1	1						
E-18	F	4 x 750														1	1	1	1				
E-19	N	4 x 850															2	1	1				
E-20	N	4 x 1200																1	1	1	1		
E-21	F	4 x 750																	1	1	2		
E-22	N	4 x 1200																		1	1	1	1
E-23	F	4 x 750																			2	1	1
E-24	N	3 x 1200																				2	1
E-25	F	2 x 750																				1	1
E-26	N	1 x 1200																					1

Legend: F – Fossil
N – Nuclear

THE GENERATION PROPOSED IN PROGRAM LRF48A

FIGURE 2

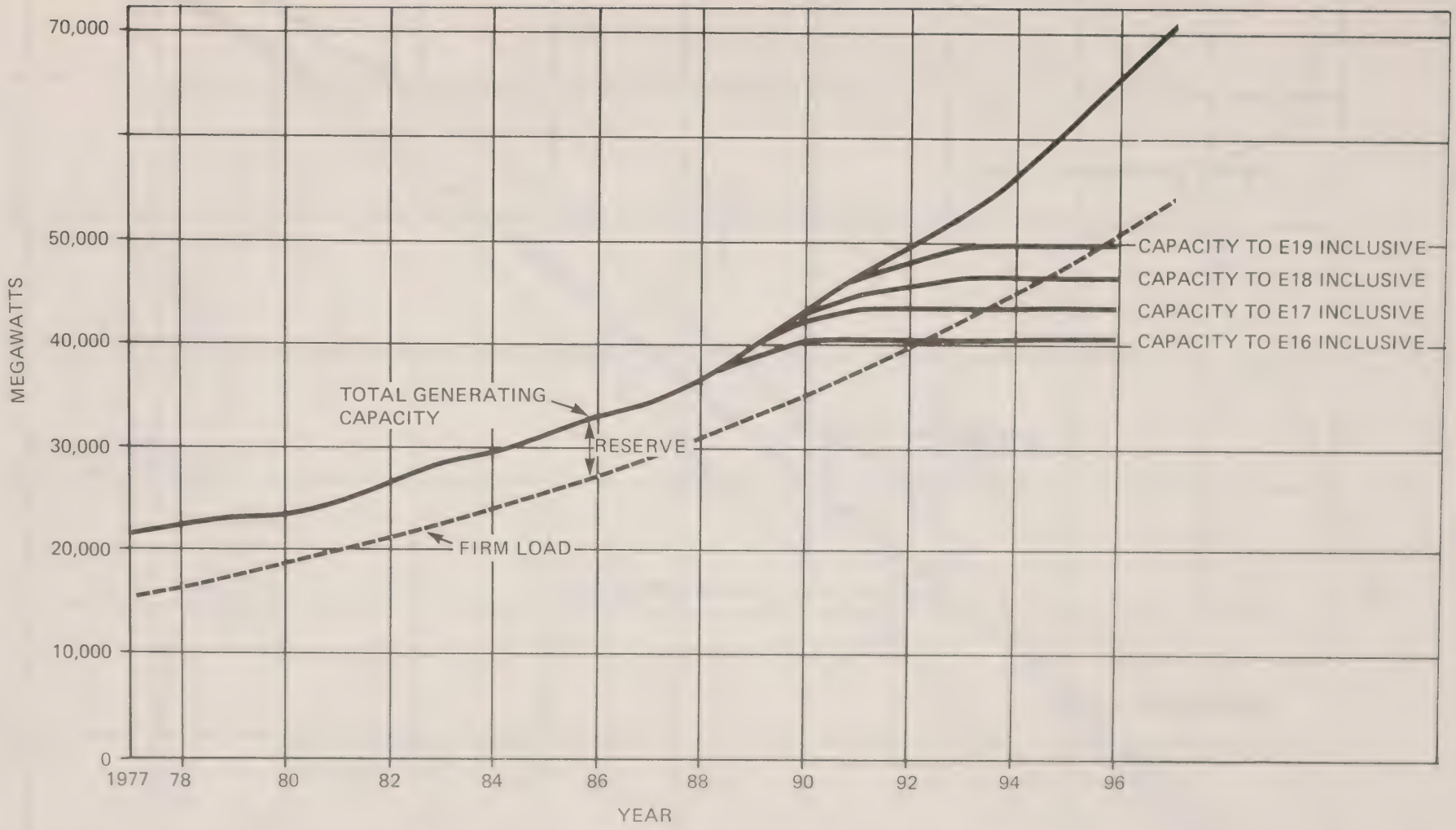
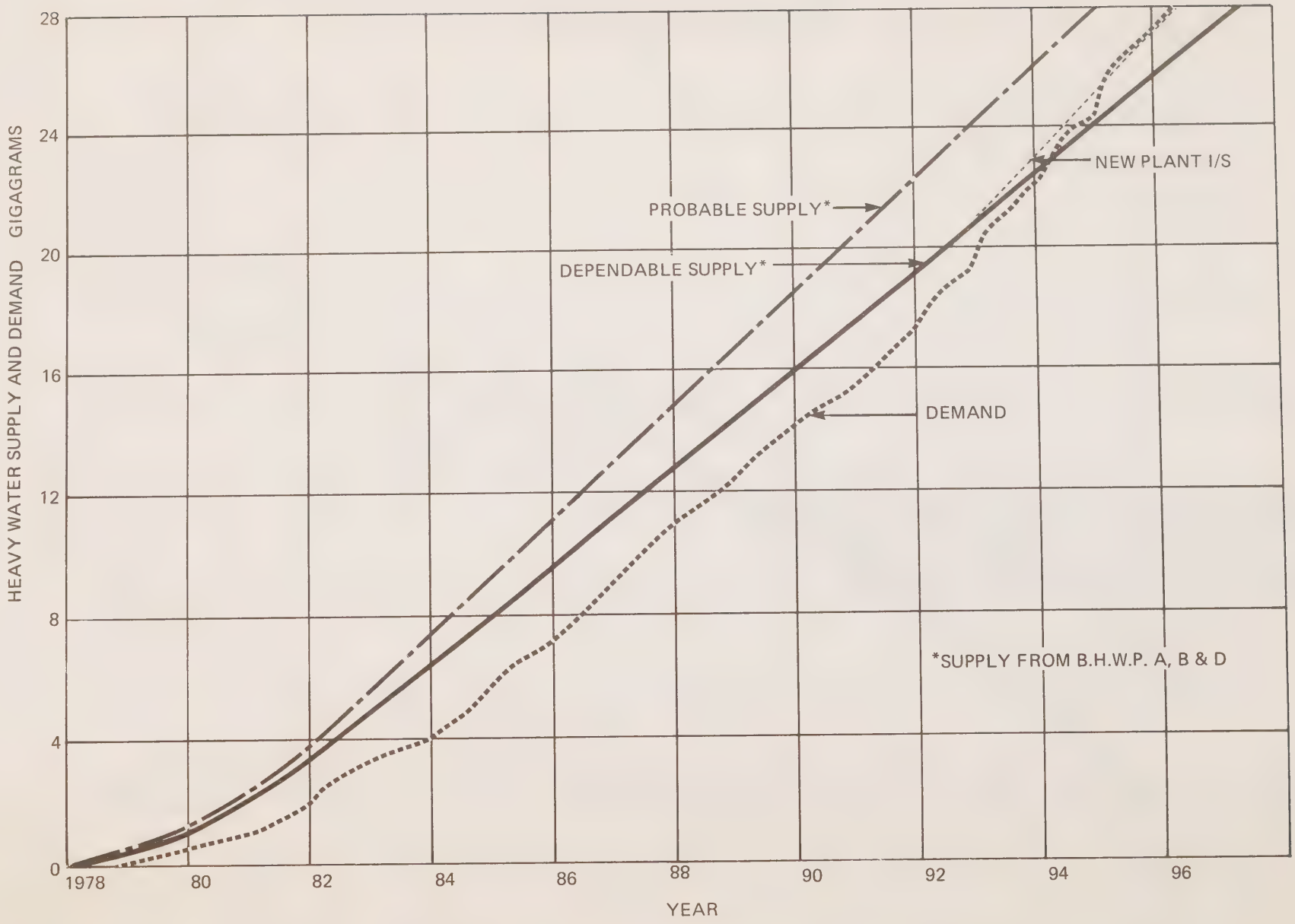


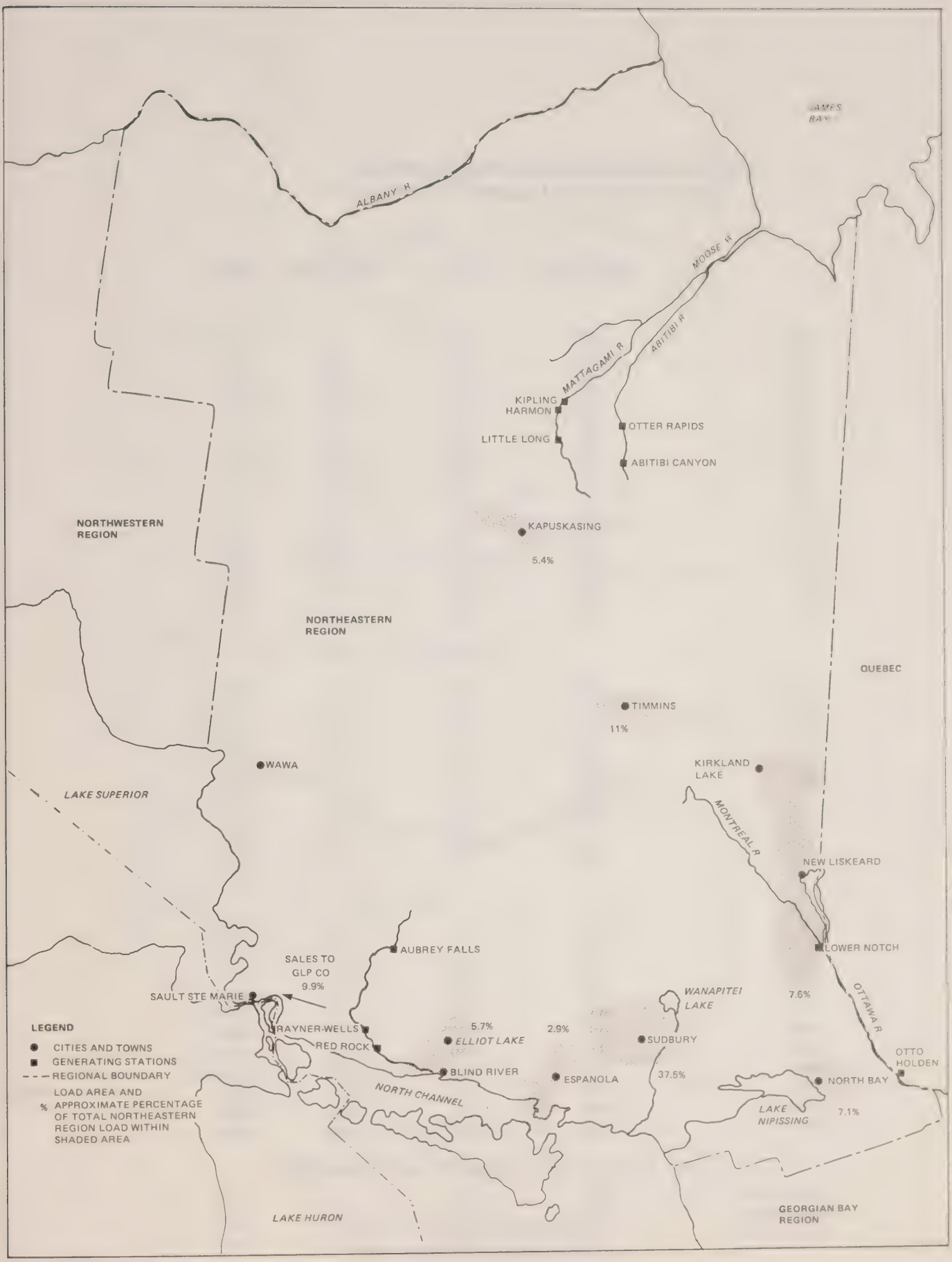
FIGURE 3

EFFECT ON GENERATION RESERVE OF
NOT INSTALLING NEW GENERATION



HEAVY WATER SUPPLY AND DEMAND

FIGURE 4



NORTHEASTERN REGION
LOCATION OF GENERATION AND MAJOR LOADS

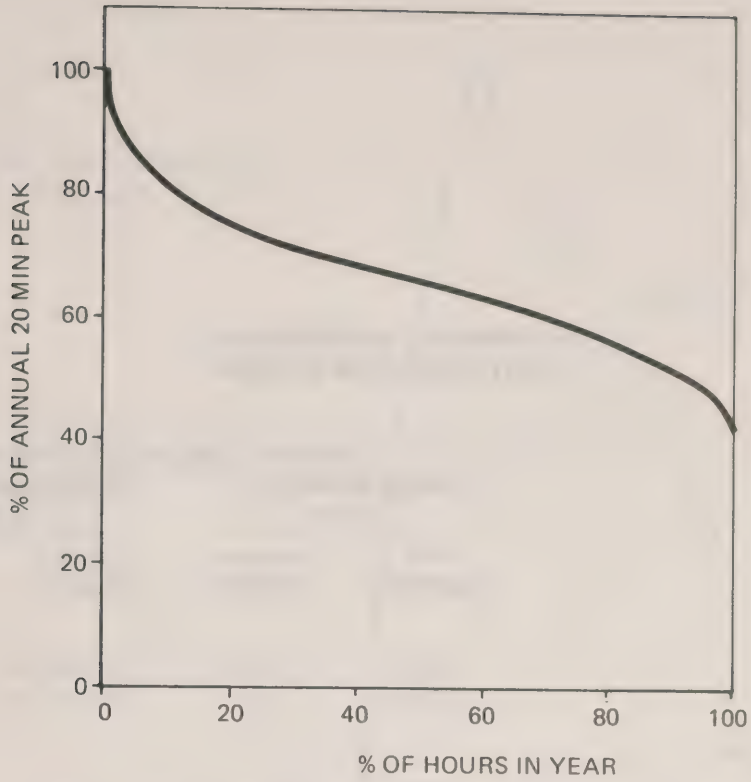
FIGURE 5

NORTH EASTERN REGION DECEMBER PEAK

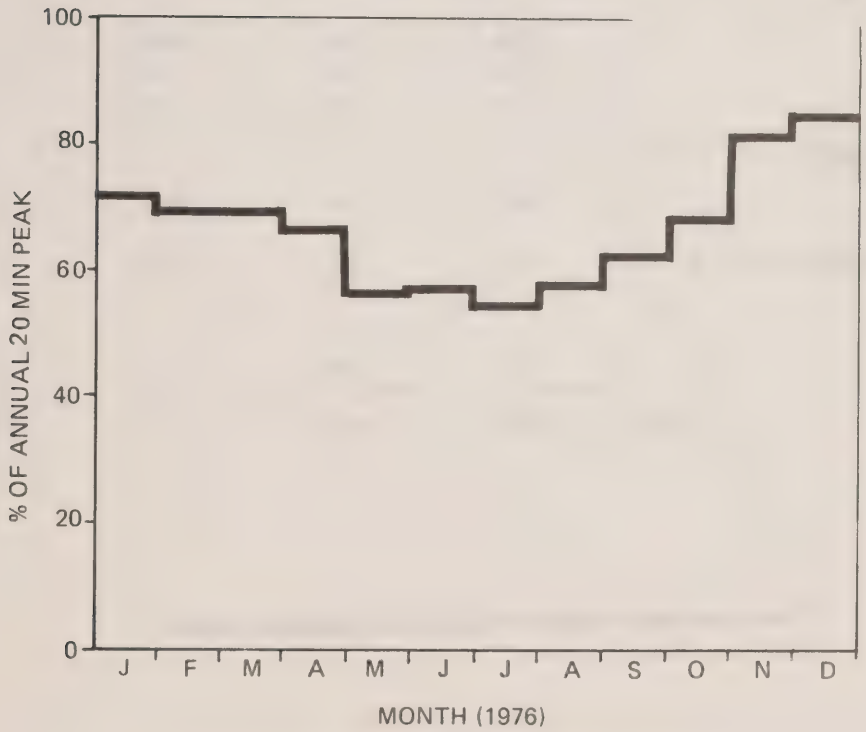
(SUM OF CUSTOMERS LOADS BY CLASSIFICATION)

	MW			
	MUNICIPAL	RETAIL	DIRECT INDUSTRIAL	TOTAL
		ACTUAL		
1962	96	119	357	572
1963	102	131	360	593
1964	107	135	365	607
1965	123	130	355	608
1966	135	145	371	651
1967	139	158	450	747
1968	159	191	495	845
1969	173	206	546	925
1970	198	271	528	997
1971	219	292	573	1084
1972	234	305	606	1145
1973	252	310	660	1222
1974	254	315	674	1243
1975	289	364	673	1326
1976	301	387	799	1487
		FORECAST – 770214		
1977	302	398	772	1472
1978	319	423	884	1626
1979	336	449	964	1749
1980	355	477	1050	1882
1981	376	506	1165	2047
1982	396	536	1307	2239
1983	418	570	1370	2358
1984	441	606	1440	2487
1985	466	645	1517	2628
1986	493	686	1602	2781
		PROJECTION		
1987	521	745	1682	2948
1988	550	810	1765	3125
1989	581	879	1851	3311
1990	613	954	1940	3507
1991	647	1035	2033	3715
1992	682	1122	2129	3933
1993	719	1216	2229	4164
1994	757	1318	2333	4408
1995	797	1427	2440	4664
1996	837	1541	2546	4924
1997	879	1665	2656	5200
		GROWTH RATE – PERCENT		
1962-1976	8.5	8.8	5.9	7.1
1976-1986	5.1	5.9	7.2	6.5
1986-1997	5.4	8.4	4.7	5.9

FIGURE 6



ANNUAL % DURATION CURVE OF HOURLY DEMANDS



AVERAGE ENERGY IN % OF DECEMBER PEAK

NORTHEASTERN REGION
LOAD CHARACTERISTICS

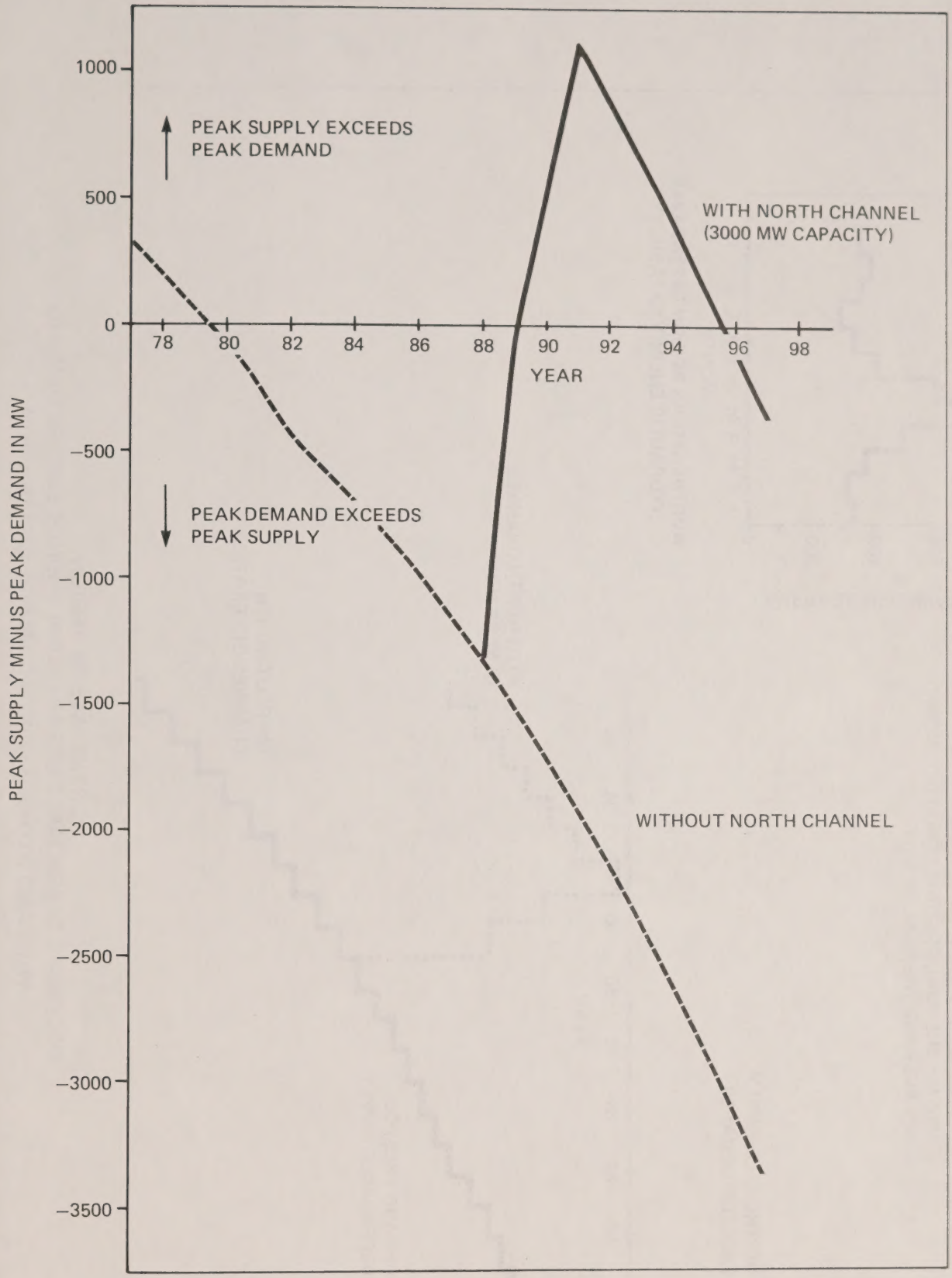
FIGURE 7

HYDRAULIC GENERATION
NORTHEASTERN REGION

STATIONS	GENERATION OUTPUT UNDER MEDIAN WATER FLOWS		GENERATION OUTPUT UNDER DEPENDABLE WATER FLOWS	
	Peak Capability	Average Capability	Peak Capability	Average Capability
ABITIBI RIVER				
Abitibi Canyon	264	128	264	79
Otter Rapids	179	65	177	39
MATTAGAMI RIVER				
Little Long	128	50	125	24
Harmon	130	54	125	25
Kipling	142	56	142	27
MISSISSAGI RIVER				
Aubrey Falls	158	23	158	12
Rayner-Wells	275	44	275	22
Red Rock	40	24	40	13
MONTREAL RIVER				
Lower Notch	267	34	253	20
BALANCE OF PLANTS IN N.E.R*	60	45	59	31
OTTAWA RIVER				
Otto Holden	215	128	193	74
TOTAL	1,858	651	1,811	366

*** This is the sum of outputs of several small Hydraulic Stations**

FIGURE 8



NORTHEASTERN REGION
PEAK SUPPLY MINUS PEAK DEMAND
WITH AND WITHOUT NORTH CHANNEL GENERATION

FIGURE 9

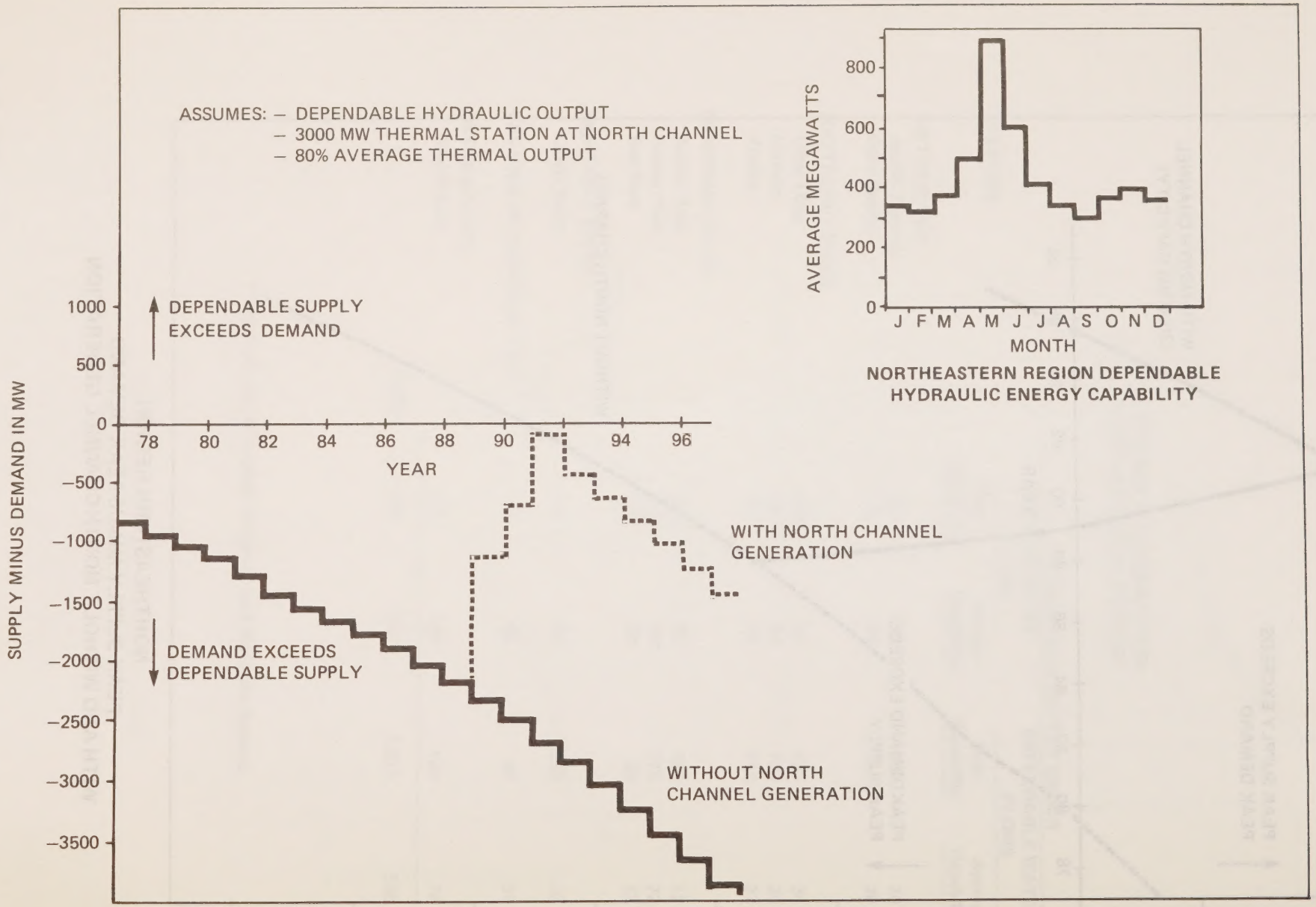


FIGURE 10

NORTHEASTERN REGION
DECEMBER DEPENDABLE ENERGY SUPPLY MINUS ENERGY DEMAND
WITH AND WITHOUT NORTH CHANNEL GENERATION